

---

---

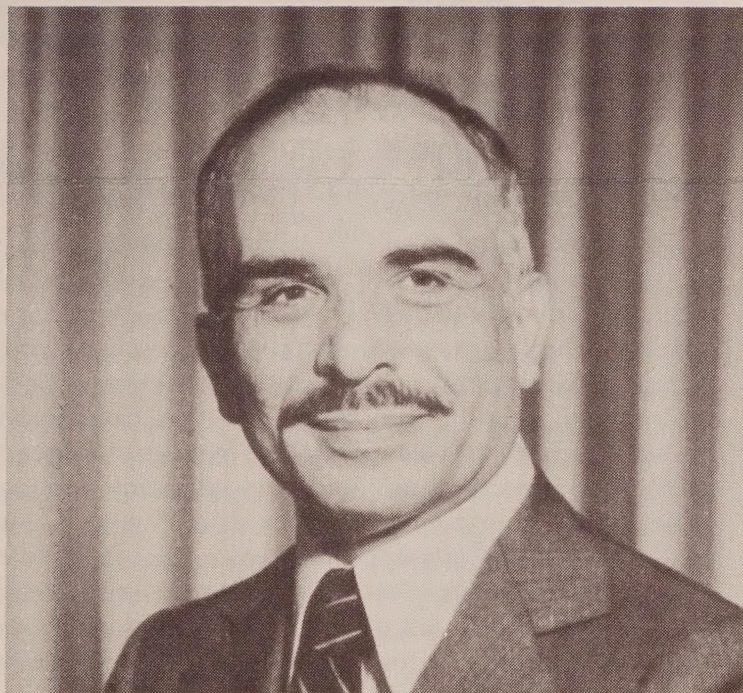
# AMSAT

## SATELLITE REPORT



**Volume 1 Number 20**  
**November 16, 1981**

**Editor:** Vern Riportella, WA2LQQ  
**Contr. Editor:** Bob Nickels, KE0T  
**Managing Editor:** Bob Myers, W1XT



### **AMSAT Gets Royal Boost!**

King Hussein of Jordan, JY1, in a telephone call from his Los Angeles hotel suite to AMSAT President Tom Clark, W3IWI, pledged his enthusiastic support of the Amateur Space Program. The King had earlier been in Washington, D.C. on an Official State visit. Visiting in L.A. the weekend of 7-8 Nov., His Highness has been an active ham for many years. Recently, he had expressed particular interest in Amateur Radio satellites. This interest had been conveyed to AMSAT through aides to the King. Although the Sunday evening, 8 Nov., call was not a total surprise, then, the King's degree of support was a very pleasant surprise. His Highness expressed his sharing of immense pride in seeing such ambitious projects brought to fruition. He went on to explain his plans for establishing his own Amateur Radio satellite ground stations in Jordan. And, as a token of support, the King indicated a modest donation would be made to AMSAT. An aide later indicated that in Royal terms, a modest token was \$10,000. Dr. Clark remarked that he had been alerted by the King's aide that, if Official schedules last week had allowed, His Highness would have received AMSAT representatives at Blair House, the Official VIP guest house across from the White House. Tom added that he understood that His Highness's schedule had been very tight and so the meeting was not possible but

left open an invitation to visit the AMSAT Lab "where the satellites are built." The King responded in return with an invitation to visit him at the palace in Ahmann if Tom were in the neighborhood. Tom graciously accepted and concluded by saying that in anticipation of the possible meeting in Washington last week, AMSAT had prepared an Honorary Life Membership for JY1. His Highness graciously acknowledged the honor and Tom added that the King's aide would carry the Life Member Certificate to him. Tom thanked the King for his support and interest on behalf of all AMSAT members.

### **Phase III Progress Report**

AMSAT's Engineering Vice President Jan King, W3GEY, returned recently from a trip to Marburg, West Germany where he consulted with the AMSAT DL team collaborating on Phase III. Jan reports that excellent progress is being made. Major efforts are now committed to completing the fabrication and testing of the liquid fuel tanks and the associated plumbing. Two tanks were recently tested to demonstrate burst strength. The tanks were filled with water and then pressurized to 1200 psi (pounds per square inch) at which time they exploded as expected. The object of the test was to determine the burst pressure. The second tank failed within a few per cent of the first demonstrating consistency in fabrication to the ESA (European Space Agency). The tanks are fabricated from a very special high strength stainless steel. The tanks must endure, in addition to very high pressure, the corrosive effects of the fuel (UMDH) and oxidizer (nitrogen tetroxide). The 1200 psi burst strength is well above the minimum required.

Jan further reported that our turn in line for launch is holding reasonably stable with October 82 still the best bet. We continue to be manifested for the ride with ECS I, the European Communications Satellite. Jan also reported that the next test launch of Ariane, LO4, will take place between 20 and 23 Dec. 81. A maritime communications satellite called MARECS A will be aboard LO4.

On the return trip to the U.S. Jan stopped over at UoSAT HQ at the University of Surrey to confer with UoSAT Program Director Martin Sweeting, G3YJO. Progress in furthering the Engineering & Evaluation Phase of UoSAT OSCAR 9 was being made in good order. For example, the motion of the satellite has now become well-

understood. The motion is apparently quite complex though not beyond control. It appears the spin axis lies in or near the plane of the ecliptic. Also, the rate of precession and nutation are also now well-understood. With the motion of the satellite thus described in detail, efforts can begin to stabilize the spacecraft in the desired attitude with the end result being better signals on the ground. When the spin is at the desired rate and the precession and nutation motions have been dampened, the gravity gradient boom can begin to be deployed. This will further dampen undesirable motions and allow the HF beacon experiment to commence.

## AMSAT Staff Appointments

AMSAT President Tom Clark, W3IWI, has announced the appointments of three prominent AMSAT leaders to new staff positions. Wray Dudley, W8GQW, has been named AMSAT Net Manager. Wray will be responsible for planning, coordinating, scheduling, publicizing, and staffing all Official AMSAT Nets. Wray's appointment is effective immediately. He currently has responsibilities on the AMSAT International Nets on 20 and 15 meters. Wray has been an active AMSAT member for a number of years and resides in Troy, Ohio. In his new capacity Wray will report to Operations VP K1HTV.

Jim McKim, W0CY, has been appointed Chief Area Coordinator for U.S./Canada. Jim was one of AMSAT's earliest Area Coordinators and currently is NCS of the AMSAT Mid America 75 meter net. Jim was spotlighted in ASR #12, 27 July 81. W0CY will coordinate the activities of the Area Coordinators in the U.S. and Canada, with special emphasis on improving communications and motivation in the corps. Jim also reports to Operations VP K1HTV in his new capacity. Jim lives in Salina, Kansas.

The third assignment announced was that of Jack Somers, WA6VGS, as Deputy Chief Area Coordinator for U.S. Jack reports to W0CY and will assist Jim in coordinating the activities of the U.S. corps of Area Coordinators. Jack has been instrumental in developing several of AMSAT's recent fund raising "trinkets" including the callsign badges and most recently the sew-on patches. Jack lives in Los Angeles and recently received Mode J WAS #1 (See ASR #16).

Other new staff positions have been identified and will be filled in the future. Specifically, the position of Deputy Chief Area Coordinator for Canada is to be filled as are several other regional slots. Tentative regional slots identified are Latin America, Europe, Asia, South Pacific and Africa.

Both W3IWI and K1HTV emphasized the importance of the appointments in further strengthening the Operations Directorate of AMSAT. "It is especially important that sound organizational structure be established and in place before the rapid growth expected to accompany Phase III," declared K1HTV. Rich is seeking to augment his staff in a number of important ways to insure user interfaces to both the satellite and to the organization are as fluid as possible.



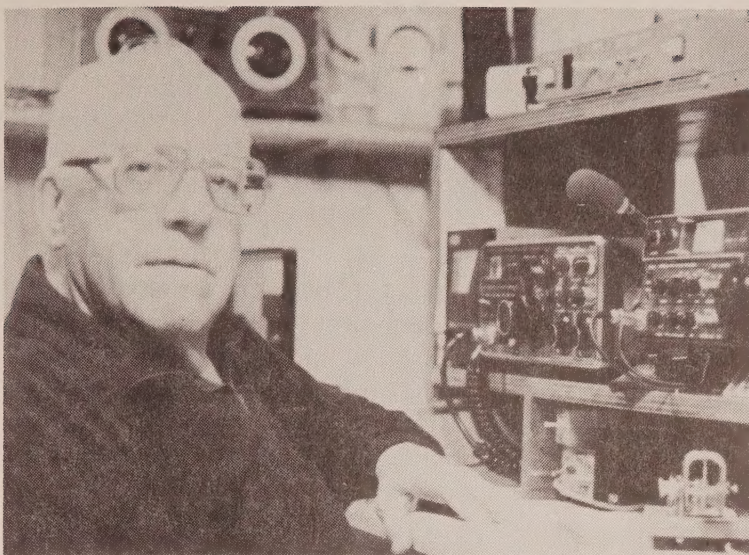
A recent visitor to the AMSAT Lab was Luciano Bertucci, TR8BL. Luciano here on the left makes a point with W3IWI.

## UoSAT Talks to Amateur Community

On 6 November UoSAT OSCAR 9 continued to expand its operations and for the first time exercised its Digitalker speech synthesizer. It went through its entire lexicon including numbers, alphabet and special words. Although the deviation on the FM signal appeared to be set low (well below 5 kHz), the signals were clearly audible spoken English. This marks the first use of a speech synthesizer in a spacecraft and offers educators a unique opportunity to inspire young scientists. Whereas with prior OSCARs the telemetry was there, the obstacle of having to copy Morse CW often proved overwhelming. But with UO-9's Digitalker, the telemetry values are virtually announced for logging on audio tape and later analysis. Digitalker is an integrated circuit speech synthesizer built by National Semiconductor.

## Source: "New RS(s) Immanent"

Usually reliable sources in Europe were saying that the launch of three new Russian Amateur Satellites (Radio Sputnik, RS) was expected in November. The new RS's were all reported to be of the Mode A variety as were their predecessors, RS-1 and 2 launched three years ago. No details were available on the expected orbits of the new birds. There has been some discussion that the Russians might try to place a new RS in a Molniya orbit similar to the one planned for Phase IIIB. However, using Mode A for such a high orbit as that which would be afforded by Molniya creates some unique problems. With Solar activity levels expected to remain high for a few years to come, a 10 meter downlink would be difficult to hear for most of the orbit above a sunlit ionosphere. The very process which has helped make 10 meter F2 propagation so good for recent months will, in other words, mask the RS 10 meter downlink from terrestrial stations except at near-vertical incidence angles. The 10 meter downlink would be refracted on top of the F2 layer for more oblique incidence angles. For now we can only guess what orbits will be provided for the new birds. The new constellation of RS's would provide a boon to DXers



## ASR Spotlight On: W6CG

For the last several issues ASR has spotlighted UoSAT OSCAR 9. In returning to our custom of featuring outstanding AMSAT members and contributors it is appropriate to recognize a fellow who is especially distinguished among any group of Amateurs. C.F. "Bud" Schultz, W6CG, has been an active satellite ham since OSCAR 6 when he made his first contact with KL7MF in October 1973. Bud was so enthralled by this that "I have never recovered since" he exclaims. He was using an old FM rig at the time and was calling CQ by sending with the PTT switch. Your Editor was pleased to work W6CG some three months later when Bud had upgraded to a TV2C. Bud's interest in Amateur Radio goes back much farther than OSCAR, however. He was first licensed as 9CSB. Bud later held W9CF while an EE student at the University of Illinois. He spent his working career in

broadcasting first with WGN in Chicago and later with the Mutual Broadcasting System (MBS).

After WWII Bud was living on the West Coast and obtained his W6CG call. His awards garnered since then include DXCC (319) WAZ, DUF-4, WBE, FOC, OOTC, QCWA AWA, BPL. His satellite achievements include OSCAR WAS#5. Bud is AMSAT Life Member #100. He is MJC #4 and his 1975 AO-7A QSO with G3IOR stands as the all-time record satellite DX.

Bud's satellite activities go beyond operating for his own pleasure, however. His service to others is notable in that he's been a command station on both AO-6 and AO-8. Additionally, he is AMSAT Area Coordinator for Southern California. Last year he initiated the Southwest Pacific AMSAT Information Net (Saturdays, 2000 UTC, 28878 kHz) and continues today as NCS of one of the most popular and productive AMSAT nets the world over. Bud's 7000 plus satellite QSO's clearly distinguishes him further.

But to those who know Bud best, these various awards and achievements are mere shrubbery around the structure of this man's character. His dedication, forthcoming nature and good humor have made Bud a long-time friend of Amateurs around the world. After one of the AMSAT International Nets on 15 meters recently a call came from a certain "G" station who inquired if this were the same W6CG he knew some 35 years ago. Bud allowed as it was and the two carried on as if their friendship had been interrupted just yesterday—not decades ago. But that's how it seems to go with Bud's many friends. They seem to chime in chorus that having once known W6CG is to never forget him. He's just that kind. ASR extends a special salute to W6CG who recently was elected an Alternate to the Board of Directors. Congratulations and 73 with mni tks from the Members de ASR and AMSAT!

if placed in orbits similar to the RS-1/2 birds. These birds had the greatest coverage area/range of any Amateur Radio Satellite by virtue of their high altitude. The frequencies provided by our European source are as follows:

Object RS "C"	145.86 - 145.90 MHz Up
	29.36 - 29.40 MHz Down
	29.40 & 29.36 Beacons
Object RS "D"	145.91 - 145.95 MHz Up
	29.41 - 29.45 MHz Down
	29.45 & 29.41 MHz Beacons
Object RS "E"	145.96 - 146.00 MHz Up
	29.46 - 29.50 MHz Down
	29.50 & 29.46 Beacons

All Amateurs are encouraged to monitor these frequencies for possible interception of the RS signals. ASR is aware of no specific date for the launch or if all three will be launched simultaneously or sequentially. If you believe you have received signals from the new birds you are urged to call AMSAT Headquarters at (301) 589-6062. Alternatively, you may call ASR Editorial Offices at (914)

986-6904. Stay tuned to 10 meters. The next few weeks should prove to be very interesting. Also it would be wise to monitor closely your AMSAT Nets for late word on any launches. Special bulletins will of course be carried on the AMSAT Nets, on the AMSAT-OSCAR satellite (AO-8) and on W1AW from ARRL HQ.

## Anniversary Certificate Aired

Bill Clepper, W3HV, has been an AO-8 Command Station for two years this past 31 Oct. Bill especially enjoys this responsibility and to share his pleasure is offering a special certificate to any station who works W3HV during the month of November. W3HV will be found at Mode A downlink frequencies of 29.430 MHz (cw) and 29.460 MHz (ssb). Bill's Mode J frequencies will be 435.130 MHz (cw) and 435.160 MHz (ssb). To receive the certificate send a #10 (business size) SASE to W3HV, 1070 Alcoma St., Sharon, PA 16146.

## UoSAT Orbit Predictions Draw Boos!

Predicting the position of UO-9 more than a week or two in advance has proved a frustrating, often embarrassing, challenge to experienced and novice OSCARites alike. The low altitude of UO-9 makes the drag factor inconsistent and determining the orbital period is akin to predicting the weather. In fact that metaphor is not too far from literal truth. The weather is a function of the atmosphere. The weather machine is driven by the sun's energy input. Similarly, the orbit of UO-9 is closely coupled with the sun's effect on the atmosphere. When the radiation output of the sun is high the upper atmosphere heats and expands significantly. The increased atmospheric drag caused by the higher particle density at UO-9's orbital altitude slows the satellite and lowers the orbit. Lowering the orbit shortens the period. Changing the period in unpredictable ways makes medium-term predictions very difficult and long-term predictions with reasonable accuracy nearly impossible. Nevertheless, it should be possible to make predictions that will hold reasonably well for a two to three week period for errors in EQX time of a few tens of seconds and in EQX longitude of a degree or two. AMSAT suggests you monitor the regular AMSAT Nets for the latest UO-9 orbital predictions and reference orbits. W1AW, the ARRL Bulletin station is also carrying the UO-9 reference orbits in its bulletin program. W9KDR, ARRL satellite coordinator has alerted AMSAT that the orbital predictions that appear in November QST are substantially in error because of the vagaries of the orbit discussed above. At press time the QST predictions were off by as much as 12 minutes. The December QST will be corrected and W1AW will keep you posted on current correction fac-

tors if any exist. W9KDR also points out that the December QST will contain art work for you to construct an overlay and range circles for UO-9 that will be usable with the new ARRL satellite locator package. (The new locator package is available from AMSAT HQ.) The art work will allow you to trace the ground track and range circles onto a sheet of acetate film such as the ones supplied with the package. Look for them in December QST.

The following are the best orbital values available at press time: For Object 81-100B (UO-9) Element Set #21

Epoch: 1981 307.55080729

Mean Anomaly: 198.2315

Inclination: 97.4563

Eccentricity: 0.0003313

Mean Motion: 15.10427976

Mean Motion (Second order term): 0.00017764

Argument of Perigee: 161.9039

RAAN: 269.3131

Semi Major Axis: 6912.987

Reference orbits:

4 Nov. 81 431 00:20:54 138.63

11 Nov. 81 537 00:52:06 146.51

18 Nov. 81 643 01:21:38 153.97

Weekly averages:

4 Nov. - 11 Nov. Period 95.3886

Incr 23.8479

11 Nov. - 18 Nov. Period 95.3728

Incr 23.8440

At present the period is decreasing at approximately 0.012 minutes/week.

The steel for the Phase IIIB fuel tanks continues on its journey to space! Here, in one of the more mundane moments in that trek, we see a near replica of the old "Build the Boat in Your Basement" trick. Having crated the sheet stainless, WA2LQQ attempts to extract the 250 pound (155 kg) crate through a basement window with a block and tackle. The operation was a success and the crate left JFK International Airport for Frankfurt, West Germany. (See accompanying story, Phase III Progress Report.)



Work, work, work! Ah, the life of a wine tester. Here W1HDX at the Annual Meeting October 17 opines on the virtues of estate bottled product. (This is actually our Phase III Ground Command Chief, John DuBois—in his distinctive Hams in Space Sweatshirt—in the process of being framed. The hand entering from the left is that of VE2VQ. Unknown conspirator at right.)

